Claims

1. A method for the diagnosis and/or therapy of NIS gene-expressing carcinomas and/or metastases, in which uptake of substances which are actively transported by the NIS symporter into the cells of carcinomas and/or metastases is stimulated and/or enhanced by means of induction of NIS gene expression in these cells.

2. The method as claimed in claim 1, characterized in that the NIS gene-expressing carcinomas and/or metastases are primary tumors and/or metastases of glandular carcinomas, in particular salivary gland carcinomas, thyroid carcinomas, uterine carcinomas and/or carcinomas of the breast.

3. The method as claimed in claim 1 or claim 2, characterized in that the induction of NIS gene expression takes place by treatment with active compounds, in particular with at least one PPAR-γ ligand and at least one RAR and/or RXR ligand.

4. The method as claimed in claim 3, characterized in that the at least one PPAR-γ ligand is a thiazolidinedione, in particular from the group consisting of ciglitazone, pioglitazone, rosiglitazone or mixtures thereof.

5. The method as claimed in claim 3 or claim 4, characterized in that the at least one RAR and/or RXR ligand is retinoic acid, in particular *trans*-retinoic acid, and/or at least one pharmacologically acceptable derivative thereof.

6. The method as claimed in claim 5, characterized in that the pharmacologically acceptable derivative is a salt or an ester, in particular an ester with an alkanoic acid preferably having 1 to 4 C atoms.

7. The method as claimed in any of claims 3 to 6, characterized in that

at least one substance which modulates, in particular enhances, the stimulation and/or the enhancement by the active compounds is additionally administered, where the substance preferably antagonizes at least one suppressor of NIS gene expression, in particular a liver lipid receptor and/or a thyroid hormone receptor.

8. The method as claimed in any of claims 1 to 7, characterized in that the substance which is actively transported by the NIS symporter into the cells of carcinomas and/or metastases is a halogen, in particular iodine, where the iodine is preferably in the form of an alkali metal and/or alkaline earth metal iodide, preferably of sodium iodide.

9. The method as claimed in any of claims 1 to 8, characterized in that the substance which is actively transported by the NIS symporter into the cells of carcinomas and/or metastases is technetium.

10. The method as claimed in any of claims 1 to 9, characterized in that the substance which is actively transported by the NIS symporter into the cells of carcinomas and/or metastases is radioactive, in particular radioactive iodine, preferably ^{123}I, ^{125}I and/or ^{131}I.

11. The method as claimed in any of claims 3 to 10, characterized in that the at least one RAR/RXR ligand is administered first and the at least one PPAR-γ ligand is administered after an appropriate time, in particular after about some hours to about some days, preferably after about 1 to about 3 days.

12. The method as claimed in any of claims 1 to 11, characterized in that metastases with a diameter of less than about 1 cm, in particular less than about 0.5 cm, can be diagnosed and/or treated.

13. A method for the *in vivo* diagnosis of NIS gene-expressing carcinomas and/or metastases of carcinomas, in particular of glandular carcinomas, preferably salivary gland carcinomas, thyroid carcinomas, uterine

carcinomas and/or carcinomas of the breast, which includes at least the following steps:

a) administration of active compounds which are able to stimulate and/or to enhance induction of NIS gene expression in cells of carcinomas and/or metastases,

b) administration of at least one substance which can be actively transported by the NIS symporter into the cells, in particular of radioactive iodine and/or technetium,

c) determination of the uptake of said substance by the cells, in particular by means of a local scintigram and/or of a whole-body scintigram.

14. A method for the *in vitro* diagnosis of NIS gene-expressing carcinomas and/or metastases of carcinomas, in particular of glandular carcinomas, preferably salivary gland carcinomas, thyroid carcinomas, uterine carcinomas and/or carcinomas of the breast, which includes at least the following steps:

a) incubation of cells of a sample to be investigated with active compounds which are able to stimulate and/or to enhance induction of NIS gene expression in cells of carcinomas and/or metastases,

b) incubation of the cells obtained in the first step with at least one substance which can be actively transported by the NIS symporter into the cells, in particular with radioactive iodine and/or techne-

c) determination of the uptake of said substance by the cells.

15. A method for the *in vitro* diagnosis of NIS gene-expressing carcinomas and/or metastases of carcinomas, in particular of glandular carcinomas, preferably salivary gland carcinomas, thyroid carcinomas, uterine carcinomas and/or carcinomas of the breast, which includes at least the following steps:

a) incubation of cells of a sample to be investigated

with active compounds which are able to stimulate and/or to enhance induction of NIS gene expression in cells of carcinomas and/or metastases,

b) determination of the expression of NIS mRNA by the cells, in particular by means of reverse transcriptase polymerase chain reaction (RT-PCR).

16. A composition for a diagnosis and/or therapy of NIS gene-expressing carcinomas and/or metastases, characterized in that this composition comprises active compounds which stimulate and/or enhance induction of NIS gene expression in the cells of carcinomas and/or metastases.

17. The composition as claimed in claim 16, characterized in that the NIS gene-expressing carcinomas and/or metastases are primary tumors and/or metastases of glandular carcinomas, in particular salivary gland carcinomas, thyroid carcinomas, uterine carcinomas and/or carcinomas of the breast.

18. The composition as claimed in claim 16 or claim 17, characterized in that the active compounds are at least one PPAR-γ ligand and at least one RAR and/or RXR ligand.

19. The composition as claimed in claim 18, characterized in that the PPAR-γ ligand is a thiazolidinedione, in particular from the group consisting of ciglitazone, pioglitazone, rosiglitazone or mixtures thereof.

20. The composition as claimed in claim 18 or claim 19, characterized in that the RAR and/or RXR ligand is retinoic acid, in particular *trans*-retinoic acid, and/or at least one pharmacologically acceptable derivative thereof.

21. The composition as claimed in claim 20, characterized in that the pharmacologically acceptable derivative is a salt or an ester, in particular an ester with an alkanoic acid preferably having 1 to 4 C atoms.

22. The composition as claimed in any of claims 16 to 21, characterized in that it additionally comprises at least one substance which modulates, in particular enhances, the stimulation and/or enhancement by the active compounds, where the substance preferably antagonizes at least one suppressor of NIS gene expression, in particular a liver lipid receptor and/or a thyroid hormone receptor.

23. The composition as claimed in any of claims 16 to 22, characterized in that it additionally comprises a histone deacetylase inhibitor, in particular trichostatin A and/or a butyrate.

24. The composition as claimed in any of claims 16 to 23, characterized in that it additionally includes at least one pharmacologically acceptable carrier and/or excipient.

25. The composition as claimed in any of claims 16 to 24, characterized in that it is intended for oral and/or parenteral administration.

26. A combination product in the form of a kit including spatially separated from one another the composition as claimed in any of claims 16 to 25, and at least one substance which can be actively transported by the NIS symporter into the cells of carcinomas and/or metastases, for separate, where appropriate sequential, use for diagnosis and/or therapy of NIS gene-expressing carcinomas and/or metastases, in particular of glandular carcinomas, preferably salivary gland carcinomas, thyroid carcinomas, uterine carcinomas and/or carcinomas of the breast.

27. The combination product as claimed in claim 26, characterized in that the substance which is actively transported by the NIS symporter into the cells of carcinomas and/or metastases is a halide, in particular iodine, and/or technetium.

28. The combination product as claimed in claim 26 or claim 27, charac-

terized in that the substance which is actively transported by the NIS symporter into the cells of carcinomas and/or metastases is radioactive.

29. The combination product as claimed in claim 28, characterized in that the radioactive substance is radioactive iodine ^{123}I, ^{125}I and/or ^{131}I, which is in particular in the form of an alkali metal or alkaline earth metal iodide, preferably of sodium iodide.

30. The use of at least one PPAR-γ ligand and at least one RAR and/or RXR ligand for producing a diagnostic composition for detecting carcinomas and/or metastases which express at least one NIS gene.

31. The use of at least one PPAR-γ ligand and at least one RAR and/or RXR ligand for producing a medicament for treating carcinomas and/or metastases which express at least one NIS gene.

32. The use as claimed in claim 30 or claim 31, characterized in that the carcinomas and/or metastases are primary tumors and/or metastases of glandular carcinomas, in particular salivary gland carcinomas, thyroid carcinomas, uterine carcinomas and/or carcinomas of the breast.

33. The use as claimed in any of claims 30 to 32, characterized in that the at least one PPAR-γ ligand is a thiazolidinedione, in particular from the group consisting of ciglitazone, pioglitazone, rosiglitazone or mixtures thereof.

34. The use as claimed in any of claims 30 to 33, characterized in that the at least one RAR and/or RXR ligand is retinoic acid, in particular *trans*-retinoic acid, and/or at least one pharmacologically acceptable derivative thereof.

35. The use as claimed in claim 34, characterized in that the pharmacologically acceptable derivative is a salt or an ester, in particular an ester with an alkanoic acid preferably having 1 to 4 C atoms.

36. The use as claimed in any of claims 30 to 35, characterized in that the diagnostic composition and/or the medicament additionally includes at least one substance which modulates, in particular enhances, a stimulation and/or enhancement of NIS gene expression by the active compounds, where the substance preferably antagonizes at least one suppressor of NIS gene expression, in particular a liver lipid receptor and/or a thyroid hormone receptor.

37. The use as claimed in any of claims 30 to 36, characterized in that the diagnostic composition and/or the medicament is intended to be employed for combination with a substance which is actively transported by the NIS symporter, in particular a halide, preferably iodine, and/or technetium, where the iodine is preferably in the form of an alkali metal and/or alkaline earth metal iodide, preferably of sodium iodide.

38. The use as claimed in claim 37, characterized in that the substance is a radioactive substance, in particular radioactive iodine, preferably ^{123}I, ^{125}I and/or ^{131}I.

39. The use as claimed in any of claims 30 to 38, characterized in that the diagnostic composition and/or the medicament is intended to be administered so that the at least one RAR and/or RXR ligand is administered first and the at least one PPAR ligand is administered after an appropriate time, in particular after about some hours to about some days, preferably after about 1 to about 3 days.